OBSERVATIONS ON THE EUCALYPTS OF NEW SOUTH WALES.

Part VI.

By Henry Deane, M.A., F.L.S., and J. H. Maiden, F.L.S.

(Plates xlviii.-l.)

Eucalyptus conica, sp.nov.

(Plate xlviii., figs. 1-3.)

A Box of medium size; a pretty, graceful tree, with pendulous branches.

Vernacular names.—"Fuzzy Box," "Bastard Box," "Yellow Box," "Grey Box" or "Woolly Butt," "Apple Box."

Bark.—Of the ordinary "box" character, but in districts where the two trees grow together rougher than that of *E. hemiphloia;* persistent in all cases, right on to the small branches.

Timber.—Reddish-yellow, and very tough when dry; much redder than ordinary Box (R. H. Cambage).

Sucker-leaves.—Pale green, not glaucous; broadly ovate; the intramarginal vein considerably distant from the margin, and, with the midrib, giving the leaf a triplinerved appearance.

Mature leaves.—Lanceolate, ultimately narrow-lanceolate, and, say, 4 inches long by half an inch broad; varying, however, in length and width, and some branchlets including very wide leaves; the intramarginal vein is distinctly removed from the edge of the leaf, although this is of course less marked in the case of narrow leaves; the venation is oblique, but few of these secondary veins are as prominent as the intramarginal vein. The foliage is drooping and has frequently long stalks.

Buds.—Clavate, the calyx-tube greatly exceeding the operculum in size; the operculum nearly hemispherical, with a small umbo; the calyx-tube tapering gradually to the common point of attachment to the stalk, the buds being sessile.

Flowers.—This is a very floriferous species; the inflorescence is arranged in panicles of several inches, the individual umbels having a maximum of six or seven flowers. Stigma hardly dilated; anthers small, opening in terminal pores, all fertile and inflected in the bud.

Fruits.—Narrow conical (hence the specific name), tapering to the point of attachment of the common stalk. Often not quite symmetrical, and somewhat pear-shaped. Greatest length, say, $\frac{3}{8}$ inch by, say, $\frac{5}{32}$ inch broad. Thin rim; the valves, which are three or four and very small, are deeply sunk. Of a pale brown colour and shining.

Range.—Found in much of the country west of the Dividing Range and its spurs, forming, with *E. hemiphloia* and *E. Behriana*, the "Box" of the western country.

Resembles *E. Stuartiana* so much that on the Lachlan it is called "Apple Box" (R.H.C.).

The affinity of *E. conica* is undoubtedly closest to *E. polyanthema*, though the trees are, in our opinion, so distinct that we cannot make one a variety of the other. At the same time it is not a strong species. The principal differences between it and *E. polyanthema* may be indicated as follows—its more pendulous habit, its less furrowed bark, which is often of a yellowish cast, its paler timber, and its narrower and non-glaucous foliage. In *E. conica* the umbels are separate in the axils of the leaves, or, by suppression of the terminal one, become an elongated panicle. The operculum is not nearly as long as the calyx-tube, while the anthers are all fertile. As regards the fruits, the fruit of *E. conica* is more narrow or slender conical and the rim is more depressed. The rim of the fruit does not appear to be indented in *E. conica*, while it is of common occurrence in *E. polyanthema*.

And, speaking generally, *E. conica* is glabrous while *E. polyanthema* is more or less glaucous.

E. AGGREGATA, sp.nov.

(Plate xlix.)

An umbrageous tree, probably worthy of cultivation in cold, damp situations, for ornamental purposes.

Local names. — "Peppermint" at Wallerawang, probably because of the fibrous appearance of the bark. Known as "Flooded Gum" in most districts, an exception to the usual rule in Australia to limit the term "Gum" to those species of Eucalypts having smooth or nearly smooth barks. It has been called both "Sally" and "Messmate" in the Crookwell district; while it is known as "Black Gum" at Fagan's Creek, according to Mr. Bäuerlen.

Bark.—Box-like or rather more flaky; between that of a Box and a Stringybark or Woollybutt; cuts woolly. The trunk, large and small branches are all rough; the ultimate branchlets alone being smooth. In old trees very thick and containing essential oil.

Timber.—White and tough when fresh, but the trunk is usually not straight enough and large enough, as a general rule, for marketable timber; reckoned worthless for standing in the ground.

Young leaves.—Quite glabrous; oval to nearly oblong; strictly opposite up to an inch long; the margins undulate; mucronate with a short point. Young trees are often eaten down by cattle.

Mature leaves.—Foliage semi-pendulous, lanceolate in shape; usually symmetrical, but oblique leaves not rare; undulate; equally green on both sides, scarcely shining; on the average probably 4½ inches long by 1 broad. Intramarginal vein considerably removed from the edge; other veins few but conspicuous; very oblique.

Buds.—Usually four to six in the umbel, but sevens not rare; stalk up to $\frac{1}{8}$ inch long, hardly compressed, more compressed as the fruit reaches maturity; the stalklets short and round. The operculum and calyx-tube about equal, and both tapering towards a point, the operculum being nearly conical.

Flowers.—Stamens apparently all fertile and inflected in the bud; stigma not dilated; anthers opening by parallel slits.

Fruits.—Hemispherical in shape and sometimes, owing to the shortening of the stalklets, so clustered together as to form a dense head, hence the specific name; small, not exceeding $\frac{3}{16}$ inch in diameter, with a well-defined, sharp rim, domed, and with 3 or 4 well exserted valves.

Size.—Usually small gnarled trees, but a number 30 or 40 feet with a trunk of 12-18 inches or even 2 feet.

Habitat and range.—Alluvial flats, following watercourses or depressions; always found in damp situations, hence the name "Flooded Gum." As regards its western localities, up to the present it has only been found west of the Blue Mountains—Wallerawang (H.D), Rydal (J.H.M.); Jenolan Caves (W. Blakely); near Orange, on the Cadia-road, which remains its most western locality at present (R. H. Cambage); Rockley and Burraga (R.H.C.). It has not been recorded north of Sydney, and its southern localities are Nimbo Station, head of Queanbeyan River; also Crookwell (H.D.) and Fagan's Creek, Braidwood district (Mr W. Bäuerlen, communicated by Mr. R. T. Baker).

Its closest affinity is undoubtedly to *E. Macarthuri*. Both grow in similar situations, are strikingly similar in appearance, have bark of similar texture and not dissimilar-looking fruit. The venation of the mature leaves and the shape of the sucker leaves, however, divide them sharply.

From *E. Stuartiana* our species is distinguished by its darker bark, smaller fruits, venation of leaves, &c. The leaves of *E. Stuartiana* are also of a darker green, and the fruits are larger. *E. Stuartiana* would not have been referred to in this connection were it not that some of the older botanists looked upon the present species as a variety of *E. Stuartiana*.

E. NOVA-ANGLICA,* sp.nov.

"Black Peppermint" of New England.

(Plate l.)

It is the Eucalypt No. 2, "Broad-suckered Peppermint" of p. 541 of Maiden's "Eucalypts of the New England Table-land" (Report A.A.A.S. vii.).

It is gregarious and occupies considerable areas often to the exclusion of other arboreal vegetation (J. F. Campbell).

Bark.—Dark straight bark (hence the local name "Black Peppermint"); thinner than that of *E. Stuartiana* ("White Peppermint" or "Apple"). Semi-persistent on the trunk, more or less ribbony on the boughs and deciduous on the ultimate branchlets.

Timber.—Of a pinkish or pale red colour when fresh, drying to a pale colour. It is of a soft nature, liable to rapid decay on reaching maturity. Of no commercial value, but used for fencing in the absence of more durable timber.

Sucker leaves.—Intensely glaucous, often 3 inches long and $2\frac{1}{2}$ inches broad. Orbicular to cordate; often stem-clasping. Twigs inclining to quadrangular in very early stage.

Mature leaves.—Lanceolate, and, when fully mature, three to four inches long and half an inch wide on the average. Veins strongly marked, pinnate and anastomosing, the intramarginal vein at some distance from the edge; the midrib and the intramarginal veins often pink, as are sometimes the other veins, while the leaf itself is often suffused with a tinge of the same colour. On the same twig it is a common occurrence to obtain the ordinary mature glabrous foliage interspersed with abundance of glaucous foliage of similar shape and of various stages towards the normal sucker foliage. This has been referred to in Maiden's Notes on the Eucalypts of New England, already quoted, and is an important character.

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* In lieu of *neo-anglica*, Abstract for November, 1898.

The foliage has a strong peppermint odour. The twigs are round.

Buds.—From two or three to six in an umbel, but clusters of four or five are commonest. On a flattened stalk of about a quarter of an inch; the stalklets less flattened and less than half the length of the stalks. The buds glaucous and often pink or purplish, ovoid, the top of the operculum somewhat pointed. The operculum usually about the same size as the calyx-tube.

Flowers.—The flowers are usually borne in great profusion, with bright yellow filaments. Stamens apparently all fertile and inflected in the bud, anthers with parallel, distinct cells; style of moderate length, the stigma nearly flat-topped and dilated a little, the appearance of the dilatation being increased by the constriction caused by the drying of the filament.

Fruits.—Variable somewhat in size, but always under a quarter of an inch in diameter; usually glaucous, but sometimes entirely glabrous. In shape nearly hemispherical, with a well-defined, more or less domed rim; the valves, which are indifferently three or four in number, exserted, and sometimes well exserted.

Size.—"A healthy mature tree seldom exceeds 6 feet in girth, after which it becomes a shell of much larger proportions and grows to a height of some 50 feet and more" (J.F.C.).

Range.—"Grows on alluvial flats, preferring the clay soil derived from the Silurian slate to that of the heavier basalt on the lighter granite" (J. F. Campbell). It is common over the greater portion of New England. It occurs on the summit of Ben Lomond. It appears to occur in Victoria, specimens from that colony possessing remarkable similarity to ours; the matter might perhaps engage the attention of our Victorian co-worker. We have shown elsewhere that the New England and Victorian forms of other species (*e.g.*, *E. amygdalina*, *E. obliqua*) are very similar, and in a number of cases New England plants have not been recorded for hundreds of miles until southern New South Wales or Victoria is reached.

The affinity of *E. nova-anglica* is undoubtedly closest to *E. Stuartiana*. Where the two species occur together the former

goes by the name of Black Peppermint and the latter White Peppermint or Apple. The latter has a white zigzag or wrinkled bark, thicker and much paler in colour than that of the Black Peppermint. *E. Stuartiana* has thickish, fleshy leaves, largish fruits (in comparison), and of a different shape to those of *E. nora-anglica*. The foliage of *E. Stuartiana* is non-glaucous except when young. Its buds are glabrous and of a different shape to those of *E. nora-anglica*. Its leaves possess a less odour of peppermint and are often eaten by cattle.

Twigs in bud and flower undoubtedly show some resemblance to *E. rubida;* the flowers of *E. nora-anglica* are, however, in more than threes, while the bark is fibrous. Also the timber of *E. nora-anglica* resembles that of the Messmate group; this circumstance alone sharply separates it from *E. rubida*.

Miscellaneous Notes.

i. RENANTHEREÆ.

E. STRICTA, Sieb. No. 472.

An authentic specimen in the National Herbarium, Melbourne, received from Prof. Engler (now of Berlin) is identical with the narrow-leaved scrubby gum from the Blue Mountains as figured by us in the Proc. for 1897, Pl. xxxi., fig. 17. The original of the *E. stricta* of the *Flora Australiensis*, *i.e.*, of Bentham, is somewhat uncertain, this botanist perhaps having *E. cneorifolia*, DC., before him.

E. OBTUSIFLORA, DC.

The National Herbarium, Melbourne, contains two specimens (single leaves only) from De Candolle's Herbarium, both different and both indeterminable.

It seems desirable to reject the name altogether. In Part iii. of our "Observations" (*Proc.* 1897, p. 714) we expressed the opinion that *E. obtusiflora* should be retained as a species, because we were then under the impression that we had absolutely identified De Candolle's plant, and that, under all the circumstances, it was a convenience to retain the name. We have revived the

name *E. virgata*, and we are now of opinion that all the specimens referable to *E. obtusiflora* may be placed with *E. stricta* or *E. virgata*. The plants known as *E. obtusiflora*, in fact, form a connecting link or series of connecting links between these two species.

E. VIRGATA, Sieb.

Is, according to an authentic specimen in the National Herbarium, Melbourne, identical with *E. Luehmanniana*, F.v.M.

We would invite attention to what we have already written under *E. Luehmanniana* and *E. virgata* (P.L.S.N.S.W., 1897, pp. 711-713, 717-719). It will be seen from perusal of this how full of difficulty the subject is, but we have paid another visit to Melbourne, and examination of additional material has convinced us as to the identity of *E. virgata* as above stated, and this name will stand and *E. Luehmanniana* consequently fall. We believe we have now arrived at finality in the matter, and invite attention to our further remarks under var. *altior*.

This identification of *virgata* with *Luehmanniana* makes it clear why Sieber adopted the name, as in the coast districts the species is invariably virgate.

E. VIRGATA, Sieb., var. ALTIOR.

See p. 713 (*loc. cit.*). A consequence of the identification of *E. virgata* with *E. Luehmanniana* is that the variety referred to must now bear the name *E. virgata*, var. *altior*. Following are some additional notes concerning it. It is not only found at Mt. Wilson, but at Mt. Victoria and other elevated parts of the Blue Mountains. It is a typical ribbony gum, the ribbons being 8 or 10 feet long and even more, broad and tough. We think it very probable the species has been sometimes noted as *E. viminalis*, judging from its appearance as a ribbony gum, but it is a handsomer and more erect species than *E. viminalis*. It is a tall tree, very straight, 60-100 feet high and even more. It has absolutely clean, shiny stems except at the butt, say for 8 or 10 feet, where it is more or less fibrous. At Mt. Wilson it is associated with

E. goniocalyx and at Mt. Victoria with the same species to a less extent. It has reddish twigs, and slightly glaucous leaves rich in oil.

Mr. J. L. Boorman has found this variety also in the southern districts, viz., at Wingello, where it is known as "Messmate." His specimens show the stalklets nearly round, and the rim of the fruit less domed. It remains to be seen whether the southern and western trees are not absolutely identical.

The Blue Mountain tree is known and cut commercially as "Mountain Ash." This is, of course, the ordinary name of *E. Sieberiana*, F.v.M. The timbers of the two trees are not dissimilar, neither are the immature fruits. We offer the statement with considerable confidence, that herein lies the cause of the confusion that has existed for so many years between *E. virgata* and *E. Sieberiana*, long considered as synonyms (*vide* Mueller's *Eucalyptographia* under *E. Sieberiana*). Considering the splendid development of the mountain form of *E. virgata*, there is no doubt that the mountain ranges are the natural home of the species, while the coast form is simply the depauperate form. In other words, that what is now named var. *altior* should be the species, and the virgate coast form simply a variety. We need scarcely say, however, that it would not be possible to alter the species name now.

E. HAEMASTOMA, Sm., var. MICRANTHA, Benth.

Mr. W. Forsyth has recently found this variety near the head of the Castlereagh River, which extends the range of the species further towards the westward than it has previously been found in this latitude. It is a large tree, and is locally known as "Cabbage Gum."

ii. PORANTHEREÆ.

E. MELLIODORA, A. Cunn.

We would invite attention to a narrow-leaved form of this species from the Lachlan and other parts of the colony. Leaves 2-3 inches long, and $\frac{1}{12}$ inch wide.

Mr. W. Forsyth has recently found this species near Coonabarabran. The fruits are nearly hemispherical, and in place of the characteristic narrow band or rim which usually encircles the slightly constricted orifice, and which is well seen on a side view of the fruit, there is a dark coloured broadish rim best seen on the top of the expanding orifice, and reminding one of the rim (and shape of fruit) of *E. haemastoma*.

This appearance is observed in fruits from other parts of the colony, *e.g.*, from Bungendore.

E. LARGIFLORENS, F.v.M. (Syn. *E. bicolor*, A. Cunn.)

A box tree attaining a large size, with somewhat scrambling habit, narrowish leaves, pendulous branches (hence the name *E. pendula*, A. Cunn.) and small fruits. Sometimes whole forests are affected by galls, so that it is next to impossible to procure a sound bud or fruit.

Found usually on river flats or other moist situations in good land throughout the greater part of the western division of the colony. In poorer or drier soil it forms a small tree sometimes called "Scrub Box" or "Dwarf Box."

It is not surprising that a species of so extensive a range exhibits considerable variation. We propose below (p. 623) to give notes on two extreme forms, readily noted by their narrow and broad leaves respectively. The extreme forms of this species present such considerable difference of appearance that we may figure them on a future occasion. The species in fact varies in the size, shape, texture and lustre of the leaf, the size and shape of the fruit, the length of pedicel, and in other characters of less importance.

Following are some notes from various districts of the colony :—

It is very common on the Lachlan. It is a handsome tree, common on the river flats, *e.g.*, about Condobolin. It is sometimes known as "Drooping Box." It has bark on the ultimate branchlets and red twigs. When cut down and allowed to wilt a little, cattle and horses will eat the leaves when hard pressed, and even the bark. Specimens from the same district have shiny

leaves, of medium width, not specially narrow, with prominent, spreading veins. Fruits subconical when dead ripe, with a defined rim at the edge of the fruit, which sometimes shows a distinct angle. Absolutely identical specimens are from Tomingley to Narromine (Dubbo district).

"Swamp Box," "White Box," and "Coolibah" on the Lachlan (Forester Kidston). The same gentleman on another occasion says:—"Long narrow leaves; a gnarled, tough, black box." It has also been styled "Grey Box." "The Commom Box of the Riverina." "Narrow-leaved Box" is a common name, of obvious meaning.

At Murrumbidgerie (Dubbo district) it is known as "Coolibah." Mr. A. Murphy says of it:—"Similar to White Box (*hemiphloia*), but a taller tree, the gum-limbs (smooth bark) come low down the tree. A useful timber, similar to but harder than that of *E. hemiphloia*. Common on the Lachlan, beginning at Parkes."

The species is common in the Darling country, and west towards the South Australian and Queensland border.

We have received two specimens (one in fruit and in young bud, the other in young bud only) from Murtee holding, with the note that sheep eat one whether as standing scrub or cut down, but will not touch the other. The twigs appear to us to be botanically identical, and the matter is certainly worthy of further investigation.

In the north-west part of the colony is a box, extensively distributed, which had puzzled us a good deal because we had not received complete material. Its foliage is pendulous, the leaves shining and commonly 3 inches long and only $\frac{3}{8}$ in. broad, reminding one in this respect of the well-known Wilga (*Geijera parviflora*). The fruits are small (about $\frac{3}{32}$ in. in diameter). In working at this species at the National Herbarium, Melbourne, we came across a specimen labelled by Leichhardt "Box bark, not Ironbark, between Condamine and Severn, June, 1843." Leichhardt's warning *re* Ironbark was to show that he had not confused it with the narrow-leaved Ironbark (afterwards named *E. crebra*) common in the district. Mueller referred it to *E. largiflorens*;

Bentham marked it, doubtfully, *amygdalina*. Latterly interest in the tree was revived by the collection of similar specimens on the plains near Baradine, N.S.W., by Mr. W. Forsyth. One of us has recently visited the Narrabri district, and has obtained a complete series of specimens, which not only show that Mueller's view was correct, but that this extreme narrowness of the leaves and smallness of the fruits is not constant, passing into the normal form. Under all the circumstances, and as smallness of the fruits is a character of this species, it seems scarcely desirable to name this graceful, narrow-leaved, small-fruited form, distinct as it appears at first sight. It may perhaps be Mueller's var. *parviflora* (B.Fl. iii. 215), of which we have not seen a specimen.

Then we have a broad-leaved form in which the leaves are frequently one inch broad, and say 3 inches long, thick ("leaves rather thin," B.Fl.) rigid, lustreless and even glaucous. Often there is a yellowish cast of twigs, midribs, buds and foliage generally. This yellowish cast is so marked in some trees that we have known them to have been called "Yellow Box" in consequence, and hence confused with *E. melliodora*. The transit to normal *largiflorens* is perfect. The broad-leaved forms are best developed in the extreme west of the colony, and they are, in the absence of flowers or fruits, sometimes difficult to discriminate from the broader-leaved forms of *E. microtheca*.

"Goborro," or "Goborra," is a tree frequently referred to by Mitchell ("Three Expeditions"), and is doubtless *E. largiflorens*, from the quotations which follow. Specimens of Goborro sent to us by two reliable correspondents are *E. largiflorens*, and we think it desirable to finally settle the nomenclature of so important a tree.

In a letter Forester Kidston says:—The tree called Goborro by the aboriginals is commonly known as "White Box" by the splitters all over Riverina. It frequents the ridgy and gravelly soiled parts, and grows with a straighter bole and straighter grain than any of the other trees called Box. The leaves are pendulous, and narrower than the Bimbil." (*E. populifolia*).

"The alluvial portion of the margin of the Darling is narrow, and in most places overgrown with the Dwarf Box" (Mitchell's *Three Exped.* i. 302).

". . . the trees which grew along the banks of the Lachlan. All were of the Dwarf Box kind, named Goborro by the natives, a sort of Eucalyptus which usually grows by itself on the lower margins of the Darling and Lachlan, and other parts subject to inundation, and on which the occasional rise of the waters is marked by the dark colour remaining on the lower part of the trunk" (*Op. cit.* ii. 30).

"Clumps of trees of the Flooded Box or 'Marura' of the natives appeared occasionally (near the Lachlan) in and about the many hollows in the surface" (ii. 49).

"The small kind (of Eucalyptus) covered with a rough bark, and never exceeding the size of fruit trees in an orchard, and called, I believe, by Mr. Oxley, the Dwarf Box, but by the natives Goborro, grows only on plains subject to inundation, and it usually bears on the lower part of the trunk the mark of the water by which it is at times surrounded. Between the Goborro and the Yarra (*E. rostrata*) there seems this difference: the Yarra grows only on the banks of rivers, lakes and ponds, from the water of which the roots derive nourishment; but when the trunk itself has been too long immersed, the tree dies, as appeared on various lakes and in reedy swamps on the Lachlan. The Goborro, on the contrary, seldom grows on the banks of a running stream, but seems to thrive in inundations, however long their duration" (ii. 55).

E. largiflorens is known as "Coolibar" on the Diamantina, Queensland, according to Dr. T. L. Bancroft. "Coolibah" and "Coolybar" are other spellings, and "Coolabah" is the name of a station on the Great Western line, 424 miles from Sydney, named after the trees: see *E. microtheca* below, to which species the name Coolibah now properly belongs.

E. Behriana, F.v.M.

This does not appear to be a strong species, apparently connecting with *E. hemiphloia* on the one hand and *E. largiflorens*

on the other. The typical form occurs in New South Wales, and the species must therefore be added to the flora of the colony. Woolls included it in his *Plants of New South Wales* (1885), but Mueller (*Second Census of Australian Plants*, 1889) continued to exclude it, probably because the necessary specimens from the colony were not available to him.

It has broadish leaves like *E. hemiphloia*, and has been often looked upon as a small-fruited form of that species. It is not Bentham's var. (?) *parviflora* (B.Fl. iii. 217), which is perhaps an Ironbark (*Eucalyptographia*).

Some localities are:—Narrandera, Wagga Wagga, Young to Grenfell, Mudgee, Dubbo to Peak Hill, Gunnedah to Coonabarabran, Wilcannia; and other places towards the north-west corner of the colony.

E. MELANOPHLOIA, F.v.M.

Gundy, 11 miles east of Scone (J. H. M., August, 1899), is its most easterly recorded locality.

iii. PARALLELANTHERÆ.

E. MICROTHECA, F.v.M.

It is the "Dwarf Box" of Forest Department Exhibition Catalogues of a few years back, where it is labelled "*E. brachypoda;* timber not much used or valued. Open plains, Lachlan, Darling and towards the Barrier Range."

It is found in the Narrabri district (on the banks of the Namoi and elsewhere), where it is known as "Coolibah." It has a rough, persistent scaly bark, and is a pretty tree, with rather dense and drooping foliage. Forester McGee, of the same district, sent it as "Coolibah" or "Swamp Box" some years ago. The leaves were very glaucous, up to 7 inches long and up to 1 inch broad.

Leaves from trees collected on the Darling River (Bourke, &c.) vary in width; leaves of the same length vary, on the same tree, from $\frac{3}{8}$ to $\frac{3}{4}$ inch broad.

The late K. H. Bennett sent this species from Ivanhoe, *viâ* Hay, under the native name, "Tangoon" with the note that "this is our largest tree, often attaining a height of 70 to 80 feet, with a diameter of 4 feet. It is the principal tree used by the blacks for the extraction of water from the roots. While indubitably *E. microtheca*, it resembles the broad-leaved forms of *E. largiflorens* The flowers are large, the leaves have a yellowish cast, and are $\frac{3}{4}$ or 1 inch broad, by $2\frac{3}{4}$ inches long, having quite a different appearance from normal *microtheca*. In fact remarks in regard to the variation in size and shape of leaves of *E. largiflorens* largely apply to *E. microtheca* also.

"Coolibah" or "Flooded Box" is found on all Gulf (of Carpentaria) waters, often in flooded ground, of a crooked growth, about 30 feet high (E. W. Palmer, *Proc. R.S.N.S.W.* 1883, p. 106). Mr. Palmer's specimens came from the Flinders, and were named *E. microtheca* by Baron von Mueller. Following are some additional particulars furnished in a letter from Mr. Palmer to the late Rev. Dr. Woolls, whom we had asked to enquire as to the differences between the Coolibah and Goborro (*E. largiflorens*):

"The Coolibah generally is of a crooked growth, but now and again, in favoured localities of deep soil, it is straight enough to make stockyard posts of about 10 to 12 inches in diameter, and 8 or 10 feet long. The wood is excessively hard and inlocked; impossible to split, and hard to bore through. It requires especially good augers to bore it. The bark is rough and scaly, and the branches are not smooth and white. The colour of the wood is very dark brown. I have seen the Flooded Box of the Darling (*i.e.*, *largiflorens*), but never examined it closely. Although it looks like our Flooded Box of the Flinders there is a difference. The Goborro seems smaller, the bark is different, and the branches are smooth and white in the bark."

Goborro (*E. largiflorens*) and Coolibah (*E. microtheca*) are frequently confused. If fruits be available the hemispherical, very open fruit, not above 2 lines diameter, the valves protruding, of the latter at once distinguishes them; while the anthers of the latter open in slits, and of the former in pores. There are other

differences. Coolibah is more a fibrous-barked tree than is usually understood by the term "Box." The differences between the two species were well known to the blacks, and it is a matter for regret that the average denizen of the interior has not acquired the information.

E. Maideni, F.v.M.

This species approaches *E. globulus*, and some botanists desirous of consolidating species might be inclined to look upon it as an extreme form of the latter. Luehmann's remarks, at p. 534, Vol. vii. *Report Aust. Assoc. Adv. Science*, are interesting in this connection. The true *E. globulus* is very rare in New South Wales, being confined to situations at no great distance from the Victorian border. We have seen in the National Herbarium at Melbourne specimens from Ovens River, Victoria; Granite Creek, Gippsland; and Nowa Nowa, an arm of Lake Tyers, Gippsland (A. W. Howitt), which are all identical, or nearly so, with typical *E. Maideni*, F.v.M. Other localities for this species in New South Wales are "Sources of stream leading to Merimbula" (Howitt), Wilson's Promontory, Mt. Dromedary (Miss Bate), Walcha district (the special localities referred to at p. 357, *Agric. Gazette*, N.S.W., for 1898, as *E. globulus*), Nulla Mountain, (Mudgee district).

E. goniocalyx, F.v.M.

This species has been found by Mr. W. Forsyth in the Warrumbungle Ranges (summit of Mt. Bulaway, 3450 feet), which locality pushes its range considerably to the westward. Fruits scarcely angled.

Mr. R. H. Cambage points out that in districts (Burraga, Rockley, &c.) where this species is known to some as "Bundy," it is confused by others with "Apple" (*E. Stuartiana*). Bundy occurs on the ridges; Apple follows the valleys, and is also found on flat basalt tops. At Burraga it is considered the best furnace wood for copper smelting.

E. SALIGNA, Sm., var. PARVIFLORA, D. & M.

This variety also occurs at Mt. Wilson and Wallerawang.

E. STUARTIANA, F.v.M.

Mr. W. Forsyth has recently found this species near the head of the Castlereagh River, where it is known as "Wollybutt." Mr. J. L. Boorman reports that about Sunny Corner it is known as "Pepperwood" as well as "Apple."

This species is the *E. Bridgesiana* of Mr. R. T. Baker (P.L.S. N.S.W., 1898, p. 164, with fig.). The figure in the *Eucalyptographia* of this species is one of the happiest of the delineations of that work, and is simply unmistakable. In both the *Flora Australiensis* and *Eucalyptographia* there is some confusion with *E. Gunnii* and perhaps another species, chiefly in regard to local names, habitat and range. We recently proceeded to the National Herbarium at Melbourne to study the specimens there, and to confer with the Curator, Mr. J. G. Luehmann, long Baron von Mueller's principal assistant, and one who best knows the late botanist's views on this and many other points. After carefully investigating the matter we saw no reason to refrain from accepting the *Eucalyptographia* plate as faithfully depicting *E. Stuartiana*, and the like remarks apply to *E. Gunnii*.

E. Stuartiana is usually known in New South Wales and Victoria as "Apple," but is not to be confused with *Angophora*. In some districts it is called "White Peppermint" owing to the whiteness of its bark. The bark is thickish, and often zig-zagged or wrinkled on the outside; the leaves also are thickish (as observed by Bentham), and non-glaucous except sometimes when quite young; they are sometimes eaten by stock. The shape of the fruits is well brought out in the figures of Mueller and Mr. Baker. The timber is one of the most worthless in the colony.

We draw attention to narrow (lanceolate) suckers in this species. The specimens were collected 7 miles east of Walcha, and the tree appears to be normal *Stuartiana* in every other

respect. It is the Eucalypt No. 1, of page 541, "Some Eucalypts of the New England Table-land" (*Proc. Aust. Assoc. Adv. Sci.* 1898).

E. SQUAMOSA, Deane & Maiden.

P.L.S.N.S.W., 1897, p. 561, pl. xix.

(Plate xlviii., figs. 4-5.)

During the year 1899 this species flowered and fruited more freely than it has done since we began to have it under observation (1889). We are therefore able to present a sketch of inflorescence and fruit which will supplement the former plate.

We are able to give additional localities for this species, viz.:— Bargo Brush (Miss Atkinson), Duck River, near Parramatta (Rev. Dr. Woolls), Richmond (H. D.). The specimens of Miss Atkinson and Dr. Woolls were collected about 40 years ago. Examination of the material in the National Herbarium, Melbourne, shows that it is the "Drooping Gum" of Woolls, near Duck River (included under *E. viminalis* by Bentham, B.Fl. iii. 240). It was probably also collected by Caley ("specimens with a hemispherical calyx-tube, and broad almost globular operculum"). *E. squamosa* possesses similarities to more than one species, and presented considerable difficulty, according to notes in the deceased botanist's herbarium. The species is not a strong one, and there is room for difference of opinion in regard to it. One of Miss Atkinson's specimens was collected in August, 1865, at Bargo Brush, and bears her note—"Weeping Gum. Pendent tree of 30 to 40 feet. Bark like Blue Gum. Found in aqueous situations. Very partial." Another specimen labelled "Blue Mountains," and absolutely identical with the preceding one, bears Mr. Luehmann's opinion—"I think this is a form of *E. tereticornis*," and that there is affinity to this species is undoubted. Coming to one of Woolls' Duck River specimens, Mueller named it *E. tereticornis*, var. *sphærocalyx*. Woolls' label was—"Flooded Gum, smooth bark; tree 30-40 feet." We may mention that all Miss Atkinson's and Dr. Woolls' specimens passed through Bentham's hands with Mueller's endorsements upon them, but his opinion was that they were a form of *E. viminalis*, as already

stated. Another opinion of Mueller's on a Duck River specimen was *E. tereticornis*, var. *amblycorys*. On another occasion he labelled a similar specimen *E. saligna* (?), and undoubtedly it possesses strong points of resemblance to that species also. The history of this tree forms an instructive illustration of the difficulties surrounding the elucidation of the genus.

E. EXIMIA, Schauer.

Shoalhaven River (Badgery's Crossing to Nowra; W. Forsyth and A. A. Hamilton). This is the most southerly locality recorded for this species, it being hitherto known scarcely south of Sydney.

EXPLANATION OF PLATES.

Plate xlviii., figs. 1-3.

Eucalyptus conica.

Fig. 1.—Flowering twig showing drooping habit.
Fig. 2.—Anther opening in pores.
Fig. 3.—Fruits.

Figs. 4-5.

E. squamosa.

Fig. 4.—Buds.
Fig. 5.—Fruits.

(To supplement Plate xix. P.L.S. 1897.)

Plate xlix.

E. aggregata.

Fig. 1.—Twig (in bud only).
Fig. 2.—Sucker foliage.
Fig. 3.—Vertical section of bud.
Fig. 4.—Cluster of fruits.
Fig. 5.—Anther.

(The drawings of figs. 1-2 were kindly made by Mr. R. T. Baker.)

Plate l.

E. nova-anglica.

Fig. 1.—Flowering twig.
Fig. 2.—Sucker leaves.
Fig. 3.—Seedling.
Fig. 4.—Vertical section of bud.
Fig. 5.—Anther.
Fig. 6.—Fruits.